Joint Helmet Mounted Cueing System (JHMCS)

The Joint Helmet Mounted Cueing System (JHMCS) is a modified HGU-55/P helmet that incorporates a visor-projected Heads-Up Display to cue weapons and sensors to the target. This new cueing system is intended to improve effectiveness in both Air-to-Air and Air-to-Ground missions. In close combat, a pilot must currently align the aircraft to shoot at a target. JHMCS allows the pilot to simply look at a target to shoot it. This system projects visual targeting and aircraft performance information on the back of the helmet's visor, enabling the pilot to monitor this information without interrupting his field of view through the cockpit canopy. The system uses a magnetic transmitter unit fixed to the aircraft canopy rail and a magnetic receiver unit mounted on the helmet to define helmet pointing positioning. A Helmet Vehicle Interface interacts with the aircraft system bus to provide signal generation for the helmet display. This system represents a significant improvement to close combat targeting and engagement capability.

The JHMCS system will be employed in the FA-18C/D/E/F, F-15C/D, and F-16 Block 40/50 and with a design that is 95 percent common to all three platforms. The United States Air Force (USAF) has eliminated funding for JHMCS in the F/A-22. When used in conjunction with an AIM-9X missile, JHMCS is intended to allow a pilot to effectively designate and kill targets in a cone more than 80 degrees to either side of the nose of the aircraft, or High Off-Boresight.

TEST & EVALUATION ACTIVITY

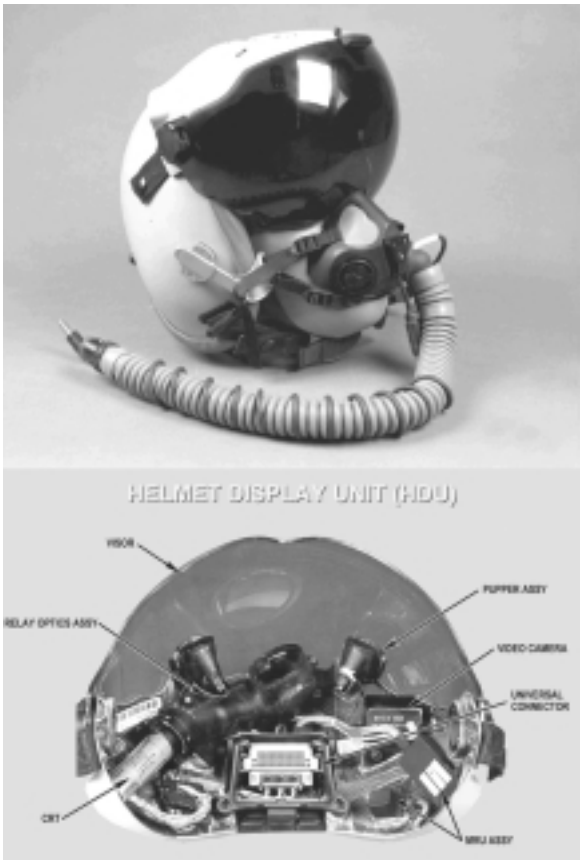
DOT&E approved the JHMCS Test and Evaluation Master Plan and the USAF and United States Navy initial operational test plans for the system. Multi-Service Operational Test and Evaluation (MOT&E) of JHMCS began in June 2001 for the USAF and October 2001 for the United States Navy and ended in June 2002.

TEST & EVALUATION ASSESSMENT

Initial tests for both the F/A-18C/D and F-15C revealed significant reliability deficiencies. The device that connects the helmet to the aircraft (helmet vehicle interface) was particularly unreliable. An operational assessment of the systems for the F/A-18C/D and F-15C found the JHMCS potentially effective and potentially not suitable due to numerous breaks in the helmet vehicle interface. Initial F-15C flight tests revealed that the legacy computer was slow in providing necessary data to JHMCS. This slow data input to the helmet coupled with normal aircraft buffet during dogfights made it difficult for the pilot to designate the target.

Since these initial tests, several corrections have been introduced but have not improved reliability to an acceptable level. Based on MOT&E data collected from June 2001 to June 2002, the commanders of Air Force Operational Test and Evaluation Center and the Navy's Operational Test and Evaluation Force determined that JHMCS was operationally effective, but not operationally suitable. Both the Navy and USAF recommended to delay full-rate production until deficient areas are fixed and verified.

Based on MOT&E data and test observations, DOT&E determined that JHMCS was operationally effective, but not operationally suitable due to significant deficiencies in reliability, maintainability, supportability, and availability of the system and concurs with the recommendation by both Services to delay full-rate production until deficient areas are fixed and verified.



DOT&E determined that the Joint Helmet Mounted Cueing System was operationally effective, but not operationally suitable and concurs with the recommendation by both Services to delay full-rate production until deficient areas are fixed and verified.

JHMCS brings a significant increase in combat capability by allowing aviators to look and designate air and ground targets in a matter of seconds and without maneuvering their aircraft.

This capability, however, has four significant limitations: low system reliability, limited night utility, incompatibility in an environment when aviators need laser eye protection, and a Navy funding mismatch between the helmet and the high-off-boresite-angle missile, AIM-9X. Low system reliability continues to seriously jeopardize system operational availability. The current system design needs to be enhanced to provide compatibility with night vision and laser eye protection goggles. This could further expand the system's capability to include operations at night and situations where aviators need laser eye protection. The Navy's funding mismatch between the helmet and AIM-9X procurement will result in the first F/A-18E/F squadrons deploying for several years with only part (JHMCS) of their high-off-boresite combat envelope. The Navy will not realize the full air-to-air combat potential of the F/A-18E/F until it corrects this funding mismatch and conducts adequate follow-on operational test and evaluation of the F/A-18E/F with JHMCS and the AIM-9X missile.